

Labs Director Steve Younger signs annual assessment letter



To all Sandians:

Every year the director of each of the three NNSA nuclear weapons laboratories writes an independent letter assessing the safety and reliability of the nuclear weapons stockpile.

Signing this letter represents the culmination of work extending over many months and engaging every division at Sandia. The foundation of the process is a set of exhaustive reviews by experts on each weapon system, supported by scientists and engineers knowledgeable in the myriad science and engineering issues that can affect safety and reliability. Several independent reviews are conducted, some of which involve people from outside the Labs. These are intended to put fresh eyes on each weapons system to ensure that nothing was missed.

One of these independent reviews, the Stockpile Assessment Team, provides technical advice directly to the Commander of the US Strategic Command. Following these reviews, I received presentations on each weapons system and on associated important topics, enabling me to write the 2017 Annual Assessment Letter to the Secretaries of Energy and Defense and the Chairwoman of the Nuclear Weapons Council.

Completion of my letter is one of my principal responsibilities as Laboratories director. By law, no one is permitted to influence the technical opinions of the NNSA laboratory directors. Each of us has the opportunity and the responsibility to make our own assessment on the state of the stockpile, assessments that will ultimately land on the President's desk.

I would like to thank all of those who supported the 2017 Annual Assessment process. The technical quality of the work that went into the many analyses, reports, and presentations was outstanding. The nation can be proud of the dedication, expertise, and experience of all Sandians who work tirelessly to assure our nuclear deterrent.

— Steve Younger, Director, Sandia National Laboratories



More efficient concentrating solar power.... 4

SANDIA
GIVS



Campaign
now on.
See pages
6-7.

Inside ...

From scientist to CEO 3

Impactful Times: Sandia and shock physics 8

Agile space improves collaboration, productivity 9



SWE honors three Sandians..... 5

Reducing power plants' freshwater consumption with Sandia's new silica filter

Sandia chemists find hydrotalcite filters up to 90 percent of silica out of cooling tower water

By Kristen Meub

Power plants draw more freshwater than any other consumer in the United States, accounting for more than half the nation's freshwater use at about 500 billion gallons daily.

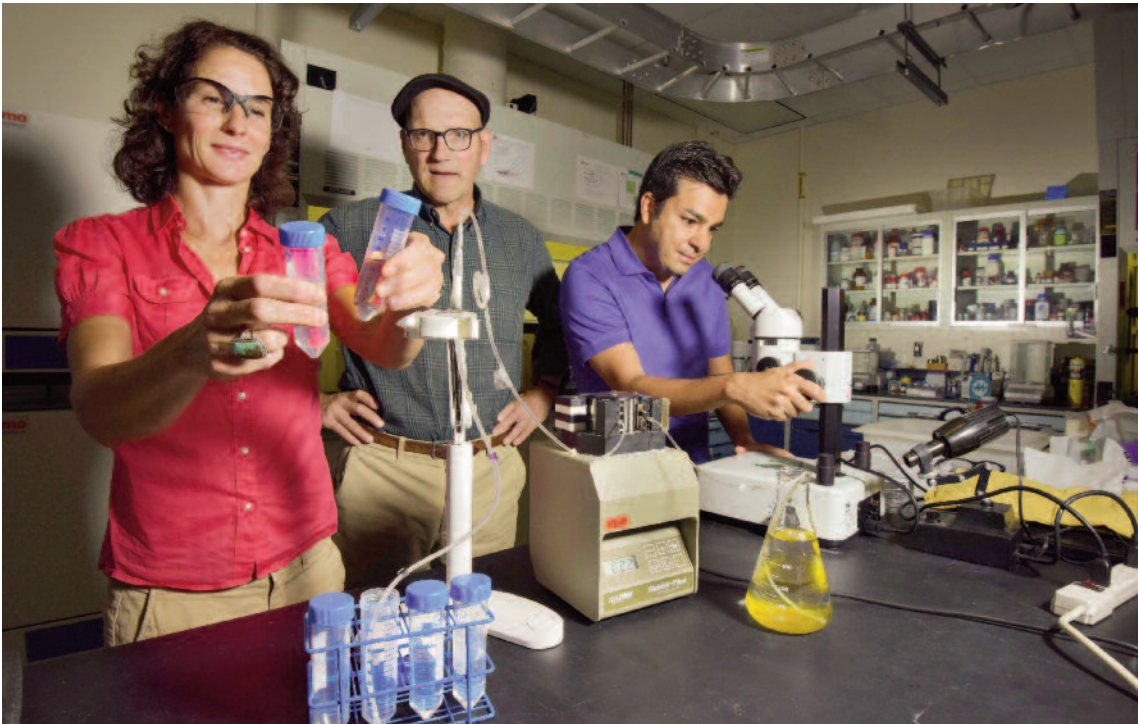
To help reduce this demand, Sandia researchers have developed a new silica filter for power plant cooling waters that decreases the amount of freshwater power plants consume by increasing the number of times cooling tower water can be reused and recycled.

"We have a limited amount of water in this country to use for everything from drinking water to raising livestock, and global population and demand is growing," geochemist Pat Brady says. "If you can recycle the water being used at power plants, it frees up a lot more water for domestic and personal use."

While power plants already recycle freshwater, the number of times a batch of water can be reused is limited by the amount of silica that builds up with each cycle. Silica is a common, naturally occurring substance in freshwater with limited solubility, and is prone to forming scales on turbines, boilers, heat exchangers, transfer pipes, and other equipment. Homeowners in the Southwest are familiar with the problem: Silica scale buildup on their evaporative coolers significantly reduces the efficiency of the units.

This buildup is problematic both for homeowners and industry because it can disrupt equipment function and is costly to prevent. The cost to treat and recycle water used at power plants is estimated to be 1.5 to 2 times the cost of freshwater, often because of the high price of current silica removal methods.

"When you have silica buildup, heat transfer is a problem, clogging is a problem, and corrosion is a problem," chemist Tina Nenoff says. "So, our project focused on finding an energy- and cost-efficient material and process to remove silica from industrial water."



FILTERING FOR SILICA Tina Nenoff, Pat Brady, and former post-doc student Koroush Sasan researched how hydrotalcite can filter silica out of cooling tower water at power plants. (Photo by Randy Montoya)

Removing silica with a special filter

Tina had worked with hydrotalcite, a layered material made of aluminum hydroxide, since the early 2000s when she was studying methods for low cost desalination, and thought the material could be an effective filter for silica.

In a two-year Laboratory Directed Research and Development project, Tina, Pat, and their research team created special filters, pellets, and powders made

of hydrotalcite to study the material's ability to filter for silica. As documented in a recent article in the Journal of Waste Process Engineering, they found that hydrotalcite could remove about 90 percent of accumulated silica in recycled water and be reused for five or more cycles. This ability to reuse the filter and recycle the cooling tower water could save both money and natural resources.

(Continued on page 4)

The Facebook posting called him "the hero in the red hat." The post was from the husband of a woman who was at the Jason Aldean concert in Las Vegas, the site that became ground zero for the deadliest mass shooting in modern US history.

The response was overwhelming, demonstrating the power and reach of social media. The man in the red hat was recognized by someone as Anthony Chavez, who, it turns out, is an Albuquerque native and a one-time employee at Sandia.

I called Anthony, and Enrique was right – it was clear to me right away that Anthony is the real deal, a straight up guy, very gracious, forthcoming, and humble about what he did on the night of the shooting. Although he'd already spoken to several members of the media – the “red hat hero” meme had gone viral – he never made me feel I was intruding on his time or personal space.

Anthony told me he and his girlfriend were very near the front of the stage, a location he called both "a good spot and a bad spot." Bad because it was right in the area considered to have been in the worst part of the so-called "kill-zone." But good because the particular location they were in was partially protected by a giant display screen on the stage.

At first, Anthony says, he heard a single shot and then a few more and thought it was fireworks - big-time concerts use a lot of pyrotechnics, after all. It pretty quickly became clear, though, that the audience in the enclosed concert space was under fire from automatic weapons.

"I crouched down, listened to the gunfire; it seemed to be coming from my 2 o'clock." He and his girlfriend worked their way toward what looked to be the best escape route – over a barrier and out of the venue.

“There were four or five women behind me; all I did was help them get over the barrier,” he says. At one point, incredibly, a security guard tried to keep Anthony and the women from getting out; Anthony warned him off in stern language. After they got out to the street and safety, Anthony asked his girlfriend to go wait for him at their nearby car, telling her he’d be along shortly. He ended up staying on the street for another hour.

First-reponders had set up an ad hoc triage station nearby and Anthony was directing those who were clearly hurt toward the station and others, those who appeared reasonably unhurt, to continue down the street and away from the venue.

"I kept yelling, trying to direct them," he says. Knowing that many people at the concert were from out of town, Anthony says he felt many of them might feel lost in a strange town in the chaos of the shooting. "I felt I needed to stay there and help people find a way to get safe," he says.

The time went by in a blur, he says, but a few incidents stand out. He recalls coming upon a woman leaning against a pole, distraught, frightened, and confused. He approached her, offered calming words, and told her "We're not going to die today." She was able to move on.

Another woman ran up to him; she was covered in blood, wracked by deep sobs. "I don't have my pants," she choked out. Anthony says he hadn't noticed but then realized, that, indeed, she was wearing only a top. He took off his shirt and wrapped it around her, soothing her.

"Look at me. My name is Anthony. I'm going to help you if you help me." She gathered herself together and moved away.

By the time he rejoined his girlfriend at their car, Anthony says, his voice was gone. He was exhausted as they headed for home.

There were many acts of heroism that terrible night. Many lost their lives saving others. Many others lived because of the fast thinking and grace under pressure of men and women who risked their own lives to help total strangers. To the women he saved, Anthony will always be their hero in the red hat. To us, he's a reminder of the caliber of people we hire at Sandia. I'm proud to know he once worked here.

See you next time.

- Bill Murphy (MS 1468, 505-845-0845, wtmurph@sandia.gov)

Sandia National Laboratories

Albuquerque, New Mexico 87185-1468
Livermore, California 94550-0969
Tonopah, Nevada • Nevada National Security Site
Amarillo, Texas • Carlsbad, New Mexico • Washington, D.C.

Sandia National Laboratories is a multimission laboratory managed and operated by National Technology and Engineering Solutions of Sandia, LLC., a wholly owned subsidiary of Honeywell International, Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.

Bill Murphy, Editor	505/845-0845
Randy Montoya, Photographer	505/844-5605
Patti Koning, California site contact	925/294-4911
Michael Lanigan, Production	505/844-2297

Contributors: Michelle Fleming (Ads, Milepost photos, 844-4902), Neal Singer (845-7078), Stephanie Holinka (284-9227), Darrick Hurst (844-8009), Heather Clark (844-3511), Sue Holmes (844-6362), Nancy Salem (844-2739), Valerie Larkin (284-7879), Lindsey Kibler (844-7988), Tim Deshler (844-2502), Mollie Rappe (844-8220), Kristen Meub (845-7215), Michael Padilla (925-294-2447), Julia Bernstein (925-294-3609), Jim Danneskiold, manager (844-0587)

Classified ads 505/844-4902

Published on alternate Fridays by Internal & Digital
Communications Dept. 3651, MS 1468







The Coronado Thunderbirds is a retiree organization open to retirees 50 years or older who have retired from Sandia, Los Alamos, DOE/NNNSA, other federal agencies, or the military. The Thunderbirds is a social club offering monthly programs (normally on the second Tuesday) plus activities such as brunch with dancing, and tours. Membership in the Kirtland Air Force Base Mountain View Club is required, and Thunderbird membership includes KAFB access, and access to Air Force Morale, Welfare, and Recreation facilities. For more information, see www.coronadothunderbirds.com.

* * *

The Coronado Thunderbirds' November meeting will be Wednesday, Nov. 15, in the ballroom at the Mountain View Club. Note that although the club normally meets the second Tuesday, there was a conflict with an Air Force event, so the November meeting will be on a Wednesday. The program will be the Rio Grande Players, which reenacts vintage radio shows. We hope you will join us for social time beginning at 11 a.m. when you can purchase lunch. The business meeting is at noon, and the program begins after the business meeting.

Recent Retirees

	
Ivory Alexander 43	Richard Stump 41
	

Lab News Reader Service

The *Sandia Lab News* is distributed in-house to all Sandia employees and on-site contractors and mailed to all Sandia retirees. It is also mailed to individuals in industry, government, academia, nonprofit organizations, media, and private life who request it and is posted online.

Retirees (only): To notify of changes in address, contact Benefits Dept. 3332, Customer Service, at 505-844-4237, or Mail Stop 1021, Sandia National Laboratories, Albuquerque, NM 87185-1021.

Others: To receive the *Lab News* or to change the address (except retirees), contact Michelle Fleming, Media Relations and Communications Dept. 3651, 505-844-4902, email meflemi@sandia.gov, or Mail Stop 0148, Sandia National Laboratories, Albuquerque, NM 87185-0165.

Web users: The *Lab News* is available online at www.sandia.gov/news/publications/labnews/.

Tech transfer on track: Tips for going from scientist to CEO

Story by Jules Bernstein

Sandstone Diagnostics Chief Scientific Officer Greg Sommer has the following advice for aspiring entrepreneurs: “Whatever you think it’s going to take, multiply that by four or more, and see if it still makes sense for you to do it.”

Sommer was referring not only to the money and time it takes to bring a product to market, but also to the grit and persistence required to get a start-up off the ground.

Fresh off receiving their Federal Laboratory Consortium award for outstanding commercialization success, Sommer and Sandstone co-founder Ulrich Schaff were featured speakers at a Sept. 20 event in Pleasanton, California.

The former Sandia scientists discussed market analysis, fundraising, legal permissions, and other aspects of turning technology they helped develop into a top new fertility product currently being sold on Amazon.

Sandstone manufactures a device called Trak, which they describe as the world’s first system allowing men to measure and track their sperm count at home. The system includes a website with tips to increase counts and an app, as well as the diagnostic device.

Trak is based on Sandia’s SpinDx, a four-pound spinning lab-on-a-disk system originally developed for disease and biological threat detection. As Schaff describes it, “SpinDx can do lots of stuff. It can count cells and analyze nucleic acids and proteins.” Part of the early challenge for Sandstone was to narrow its focus to one specific product.

Market analysis

Sommer said Sandstone started building its product in an order that isn’t necessarily optimal. They licensed the SpinDx technology from Sandia and formed Sandstone before settling on a direction. They looked at different applications, ideas, markets, and competitors before realizing that male fertility held the greatest promise for a potential business.

During this period, Schaff and his wife were expecting a child, which helped direct their thinking. Initially they considered making pregnancy tests, but that market is already saturated and those devices don’t require centrifuge technology.

Then Sommer said they discovered that men’s sperm counts have been on the decline for decades, and that the only device on the market for men didn’t quantify the sperm count or help the consumer improve their numbers.

“When we talked about the usefulness of other products out there, we used the analogy of trying to lose weight with a bathroom scale that only says, ‘overweight or not overweight,’” Sommer said. “You want to see that you lost five pounds since last week and set some targets to hit. We applied that to male fertility.”

Ulrich’s wife Sara, a third co-founder, also did a lot of market analysis once the idea was born. She spoke to many hopeful parents who expressed unequivocal enthusiasm for a Trak-type system, and this let them know they were headed in the right direction.

Fundraising

Once settled on a product, raising money and setting up clinical trials were the next hurdles for the company. Sandstone got its start-up money after knocking on a lot of doors that didn’t open for them — a task requiring tenacity because of intense competition for capital.

“You have to have a really good story and be flexible. Take all the ‘no’ answers, get better with your next pitch, and early on talk to anyone who will talk to you. Try to get as many introductions as you can and find the right people,” Sommer advised.

He said the very first money finally came as the result of a pitch competition. One of the other presenters heard Sommer speak and introduced him to some well-heeled investors. After a 15-minute meeting at a Starbucks, Sommer says they were in. That money then helped raise a formal funding round with a bigger syndicate of local angel investors.

“You have to keep your smiles up and hopefully things like that will happen,” he said. Just as critical, Sommer says, is for entrepreneurs to set near-term, achievable milestones for fundraising. As of today, the company has raised approximately \$5 million between private investments and grants.

Clinical trials and FDA approvals

Getting the right endorsements from the medical community is vital to establishing credibility for any consumer health product. Just as important is getting approval from



SANDSTONE DIAGNOSTICS co-founders and former Sandians Greg Sommer (left) and Ulrich Schaff. Sommer is holding Trak, their in-home male fertility testing system. (Photo by Jules Bernstein)

“Whatever you think it’s going to take, multiply that by four or more, and see if it still makes sense for you to do it.”

— Greg Sommer

the Food and Drug Administration. A large portion of the early budget has to be set aside for this, Sommer said.

Schaff explained that clinical trials required for FDA approval are costly because “you need lots of experts to figure out the intricacies of federal law and regulations on medical devices. It’s not that the FDA shows up at your door and charges you a million dollars,” he joked.

In addition, trials require the investment of time to recruit hundreds of men to test the device, and then the time to confirm in-home results in a laboratory. There are considerations like documentation, training, and flights to meet with doctors who run the fertility clinics they partnered with in multiple states.

Many companies fail at this stage, so Schaff says Sandstone is really proud of having overcome this hurdle.

As far as in-home diagnostic devices go, the Trak system is now the proverbial talk of the town. It has earned national media attention from publications

like *Popular Science*, *Bloomberg Businessweek*, *Men’s Health*, and *TechCrunch*.

“It’s really impressive how quickly they were able to take it from the garage to the company down the street, to FDA approvals, clinical trials, having partnerships with manufacturers, doctors in New York and LA, putting all that together, and now having a commercial product and being featured in *Newsweek*,” Sandia virologist Brooke Harmon said at the end of the evening.

The result of all this rapid growth is more than professional success. Schaff says that founding a company has been personally enriching as well.

“It’s both the highest and lowest level job you’ll ever have at the same time because you’re responsible for everything from company vision to garbage collection,” Schaff said. “When I started Sandstone I was a scientist. As we progressed, I’ve learned manufacturing, engineering, how to run clinical trials, and manage a team. I’m a different person now than I was five years ago.”

Sunny side up

New fractal-like concentrating solar power receivers are better at absorbing sunlight

By Kristen Meub

Sandia engineers have developed new fractal-like, concentrating solar power receivers for small- to medium-scale use that are up to 20 percent more effective at absorbing sunlight than current technology. The receivers were designed and studied as part of a Laboratory Directed Research and Development project and are also being applied to Sandia’s work for the Solar Energy Research Institute for India and the United States (SERIUS).

SERIUS is a five-year project co-led by the Indian Institute of Science and the National Renewable Energy Laboratory, sponsored by DOE and the government of India, that aims to develop and improve cost-effective solar technology for both countries by addressing the barriers and challenges of each market. Sandia has led the group’s research in concentrating solar power, focusing on scalable systems.

While most concentrating solar power facilities throughout the world are large in size, Sandia engineer Cliff Ho says India is interested in developing 1 megawatt or smaller facilities that could provide the appropriate amount of power for a small village or community. Improving the efficiency of these smaller receiver designs is a key step toward making that goal a reality.

Trapping and absorbing reflected light

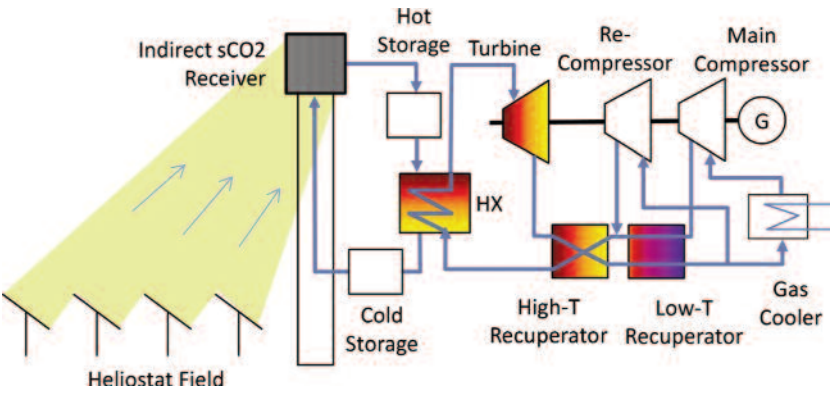
Sandia engineers developed and tested the new receivers at the National Solar Thermal Test Facility, studying their ability to withstand high temperatures and pressures while absorbing sunlight as heat that can be stored or transferred to a power cycle to generate electricity. At Sandia’s facility, rows of mirror-like heliostats are aimed at a 200-foot-tall tower with a central receiver

centrated sunlight directed at them when considering reflections and heat loss, but Cliff says design improvements to make the receivers even more efficient are needed to help reduce the cost of concentrating solar power and improve scalability.

“When light is reflected off of a flat surface, it’s gone,” Cliff says. “On a flat receiver design, 5 percent or more of the concentrated sunlight reflects away. So we configured the panels of tubes in a radial or louvered pattern that traps the light at different scales. We wanted the light to reflect, and then reflect again toward the interior of the receiver and get absorbed, sort of like the walls of a sound-proof room.”

Previous research on making solar receivers more efficient has focused on special coatings that are applied to the receiver. However, many of these coatings are susceptible to breaking down over time, which reduces both the ability of the receiver to absorb sunlight and the potential lifetime for the solar receiver itself while increasing costs due to reapplication and repair. Sandia’s new fractal-like receiver designs have increased solar absorption efficiency without the need for special coatings.

NEW SOLAR RECEIVERS Year-round Sandia intern Jesus Ortega inspects one of the new bladed receivers at the National Solar Thermal Testing Facility. (Photo by Randy Montoya)



BRAYTON POWER CYCLE — The heat from Concentrating Solar Power would be used to heat the supercritical CO₂ to desired temperatures (700 C), replacing the burning of fossil fuels.

installed at the top. The heliostats reflect and concentrate the sunlight on the receiver, which absorbs the sunlight’s heat and transfers it to gas flowing through the receiver’s paneling. The gas can then be used in a conventional power plant cycle to produce electricity or used with a storage system to be saved for on-demand electricity production when the sun is not shining. Conventional receiver designs usually feature a flat panel of tubes or tubes arranged in a cylinder. These designs can absorb about 80 to 90 percent of the con-

extremely expensive. It gives us a little more flexibility to create a smaller concentrating solar power system that will work for their needs.”

Testing first 3-D ‘printed’ solar receivers

The team pioneered the use of an additive manufacturing technique called powder-bed fusion to print their small-scale receiver designs from Inconel 718, a high-temperature nickel alloy. Cliff says this novel printing technique provided a cost-effective way to test multiple

fractal designs at a small scale and could be used in the future to print entire sections of larger solar receivers. “Additive manufacturing enabled us to generate complex geometries for the receiver tubes in a small-scale prototype,” Cliff says. “Fabricating these complex geometries using traditional methods such as extrusion, casting, or welding would have been difficult.” The new designs work with conventional heat-transfer fluids for concentrating solar power, including molten salts and steam, but they can also use other media for heat transfer and storage.

Interest in US and India

Sandia is currently evaluating the receivers’ performance with different gases by flowing air, carbon dioxide, and helium through the receiver tubes with the ultimate goal of pairing the new receiver designs with supercritical carbon dioxide (sCO₂) Brayton cycles. The term “supercritical” describes the semi-liquid state of carbon dioxide when it is heated above its normal critical temperature and pressure, and a Brayton cycle functions by using the hot, pressurized sCO₂ to spin a turbine, much like a jet engine, which spins a generator for electricity production.

Cliff says both the US and India are interested in pursuing supercritical carbon dioxide to develop the next generation of concentrating solar power technology because it can reach greater efficiencies with smaller footprints.

“The goal of concentrating solar power and SERIUS is to develop efficient, cost-effective solar-driven electricity production with energy storage,” Cliff says. “The use of a solarized supercritical carbon-dioxide Brayton cycle would increase efficiencies, reduce space requirements, and reduce costs associated with current large-scale concentrating solar power systems.”

The smaller footprint and cost would help enable the possibility of small-scale (1–10 megawatt) supercritical carbon-dioxide Brayton cycle-based concentrating solar power plants, Cliff says, making concentrating solar power more competitive with other types of renewable energy.

Silica removal

(Continued from page 1)

“Envision pellets of hydrotalcite or a powder like the kind found in a drinking water filter,” Tina says. “The water flows through or over the material during the filtration process, and the silica from the water crystallizes and remains in the filter while cleaner water flows out.” The research team designed the hydrotalcite material to be used to filter cooling tower water at power plants. During the cooling process, some of the water evaporates and the minerals in the water, including silica, build up with each cycle. “When you heat the water up and some of it evaporates, the silica and other materials in the water become more concentrated,” Pat says. “Right now, you may be able to use the water for a few cycles before it becomes too concentrated, but we are aiming for 10 or more cycles so that power plants can cut down on water use.”

From the lab to real-world application

In addition to studying the material and its effectiveness, the team wanted to determine how to best scale up the new filtration material so that it would be viable



USE OF HYDROTALCITE (HTC) as an ion exchange material is an effective method for removing dissolved silica from industrial and utility water supplies.

for large-scale operations at power plants. Students in the University of New Mexico’s civil engineering department, working under the direction of professor Kerry Howe, performed a scale-up analysis on the material, and researchers at Sandia/California performed a techno-economic analysis to estimate cost and energy savings for real-world applications. “The measurements we do here are in beakers the size of a coffee cup, but when you’re at a facility like a power plant that uses a million gallons a day, you want to know if hydrotalcite will be effective at that level,” Pat says. The research team used the multidisciplinary

approach and analyses to guide their experiments to find the best treatment of hydrotalcite for cost- and energy-efficient industrial use. “A lot of the industry will already have a silica removal process that works, but it may not work well,” Tina says. “As a result of this project, we’ll be able to give them an estimated cost and energy savings, and even a projected lifetime savings that hydrotalcite could provide over their current method. That sort of modeling and analysis provides more incentive to take the risk of implementing a new method.” The team has published three journal articles and filed a provisional patent application for their filter.

Three Sandia engineers recognized by SWE for contributions to advancing women in STEM

By **Lindsey Kibler**

Three Sandia engineers have been recognized by the Society of Women Engineers (SWE) as part of its annual awards program for their support in the enrichment and advancement of women in engineering.

- **Janet Williams** won the Distinguished Service Award, which recognizes members who have made significant contributions to SWE for at least 20 years, especially at the local and regional levels or on society-level committees.

- **Kelly Hahn**, Emerging Leader Award, which honors individuals “who have been actively engaged in an engineering or technology profession, and have demonstrated outstanding technical excellence as an individual resulting in significant accomplishments.”

- **Leslie Phinney**, Prism Award, honors “a woman who has charted her own path throughout her career, providing leadership in technology fields and professional organizations along the way.”

“The men and women recognized this year have made significant contributions to the engineering community,” said Society of Women Engineers (SWE) President Jonna Gerken. “They are leaders, inspiring the current and future generation of STEM professionals, and paving the way to empowerment for women engineers everywhere.”

Janet William: 30 years of service, commitment

Janet joined Sandia in 1985 and served in management in corporate construction, facilities planning and project development, and infrastructure programs. In 2006, she was selected to be the site strategy manager at the Atomic Weapons Establishment in the United Kingdom. Following the two-year assignment, Janet returned to New Mexico to manage the weapons integration department before she was selected to be a senior infrastructure consultant for the National Nuclear Security Administration, or NNSA, in Washington, D.C. In this position, Janet led efforts to develop an integrated, capability-focused strategic infrastructure framework across the nuclear weapons enterprise.

Now, Janet is responsible for infrastructure and capability analysis and weapons data analysis for nuclear weapons program planning, providing support for NNSA strategic infrastructure initiatives and the congressionally mandated Stockpile Stewardship and Management Plan.

It was in her last year of undergraduate school that Janet became involved with SWE. When a position with Sandia brought her to Albuquerque, she found herself without a local society section, so she joined forces with other women engineers whose efforts led to the 1988 charter of the SWE-Central New Mexico section. In 1994 she received the Distinguished New Engineer Award and the Fellow Award in 2009.

Janet says she deeply appreciates the recognition of her contributions to the Society by her peers. “When I reflect on my career and my SWE experiences over the years, I feel that giving my time and knowledge to SWE’s goals of helping women find rewarding careers in engineering also helped me develop skills that furthered my contributions to Sandia,” she says. “The dual opportunities to encourage women engineers and to serve the nation made my Sandia and SWE experiences doubly gratifying.”

Kelly Hahn: An emerging leader in neutron diagnostic field

After joining Sandia in 2001 as a student intern, Kelly held a number of research positions working on intense electron-beam-driven radiography sources until she began working in 2010 in the neutron and particle diagnostics department, where she primarily fields several nuclear activation diagnostics to support Inertial Confinement Fusion experiments on the Z Machine.

As an expert on measuring neutron yield, Kelly was the primary scientist supporting the measurements associated with a Laboratory Directed Research and Development project to develop new physical simulation capabilities to qualify non-nuclear weapons components in radiation environments. With others across the Labs, Kelly’s expertise helped make possible new experiments to boost Z Machine’s neutron and energy output.

Kelly has a doctorate in electrical engineering from the University of New Mexico

and has co-authored more than 70 peer-reviewed and conference articles, of which she is first author on 15.

She is an active and engaged member of the American Physical Society and serves on the Electrical and Computer Engineering advisory board at the University of New Mexico. Through her professors and other associates in the engineering department, Kelly learned the importance of encouraging female students of all ages, especially those in elementary and middle school, to consider engineering fields.

“I think some students, particularly females, seem intimidated by engineering fields because they are afraid to make mistakes,” Kelly says. “Everyone makes mistakes — myself included. Mistakes are an integral part of the research and development environment. By working with a team, mistakes can be remedied more quickly and that benefits the entire team.”

In her mentorship role, Kelly encourages students to be actively involved in technical areas outside of their disciplines so they can be exposed to different aspects of the research and development field.

“I am truly flattered by this award, and I feel tremendously honored that several of my respected colleagues took time to prepare sincere letters of recommendation for the award. It further boosts my interest in wanting to pay it forward to inspire other females to join STEM fields,” she says.



Leslie Phinney: Charting her path through leadership, ingenuity, and empowerment

Leslie began her career at Sandia in 2003 and has, over the course of 14 years, conducted research in the fields of heat transfer and microsystems, and advanced the knowledge in areas of thermal analysis to support national security applications, thermal property measurements, microscale heat transfer, thermal microactuators, and diagnostic techniques for microsystems.

In 2009, Sandia’s Advanced Science & Technology Division looked at improving workplace experiences by creating the Workplace Enhancement Council, a liaison group between employees and division leadership. Leslie was a founding member and its first chair. In her role, she led the conception and implementation of new hire and mentoring initiatives. She has also organized panel discussions on professional society engagement, external assignments and opportunities, and speed networking and mentoring sessions.

Leslie accepted an assignment in the Office of the Chief Technology Officer (CTO) in 2012. The Office of the CTO, together with the Research Leadership Team, is responsible for the governance and leadership of research strategy and stewardship of capabilities at the laboratories. “Passion for providing the best research environment for colleagues to thrive and succeed in” is what motivated her to accept the position. During the 16-month assignment, Leslie provided a foundation for improvement initiatives by analyzing and documenting research environment findings, activities and recommendations. Her report led to the adoption of an aspirational Ideal Research Environment description, outlined in the *State of the Research Environment – 2013*.

Today, Leslie is a thermal analyst working in thermal sciences and engineering. Thermal analysts supplement experimentation and testing to ensure nuclear weapons will operate reliably, and not fail, if exposed to extreme environments.

After receiving her doctorate in mechanical engineering from the University of California at Berkeley in 1997, Leslie was an assistant professor at the University of Illinois at Urbana-Champaign’s Department of Mechanical and Industrial Engineering, where she developed a new graduate course on microscale thermophysics of solids. In addition, she has co-authored two book chapters, 49 peer-reviewed journal articles and 51 papers presented at national and international conferences.

She is a Fellow of the American Society of Mechanical Engineers, or ASME, and was an associate editor for the *Transactions of the ASME: Journal of Heat Transfer*. She was an industrial advisory board member for Purdue University’s Cooling Technologies Research Center, chairing it in 2010.

Leslie says her belief that the community broadly encompasses where she works and lives is a driving force for her commitment to improving it. She has supported the United Way’s Women in Philanthropy for more than a decade. Her volunteer efforts have supported the Society of Women Engineers – Central New Mexico section, Sandia Women’s Action Network, New Mexico Engineering Foundation, Junior League of Albuquerque, and the Albuquerque Rose Society.

“I focus my charitable giving primarily on organizations that empower women, expand educational opportunities, assist those in need, protect the environment, and preserve important historical and cultural sites,” she says.



LESLIE PHINNEY



JANET WILLIAMS



KELLY HAHN

SWE WILL RECOGNIZE Janet, Kelly, and Leslie at its annual event — the world’s largest conference and career fair for women engineers — Oct. 26-28, in Austin, Texas. The not-for-profit SWE was founded in 1950 and, according to its website, is the world’s largest advocate and catalyst for change for women in engineering and technology.

Sandia Gives Campaign

our annual opportunity to help strangers and each other

By Katrina Wagner

No one is exempt from needing help, whether the need be minor and short-term, or a significant long-term issue. Tragedy can strike anyone at any time. Whether there's been a medical emergency, a tragic death, a loss of job or income, or someone close to you is in need of food support, our community is rich with resources that can help. Sandia Gives is the annual opportunity for members of the workforce to give through the United Way to nonprofits that strengthen the community where we live and work.

When a child is injured or sick, Ronald McDonald House Charities helps keeps families together near the resources they need

"Her will to live and fight was awesome to experience"
— **Andres Adame Miera**

Ronald McDonald House Charities provides temporary homes to families of seriously ill and injured infants and children who must receive critical medical care from area medical facilities. The nonprofit's annual report states, "RMHC provided 2,422,765 overnight stays for families with sick children in 2016." In 2003, one of those families helped by the nonprofit was Andres Adame Miera, his then-wife, and their critically ill premature baby girl, Alyssa.

Alyssa stopped developing in utero and was born two months early via C-section. At 1 pound, 6 ounces, she spent the next two months in the neonatal intensive care unit at Presbyterian Hospital, where she fought to live. Alyssa wore doll

clothes and fit in the palm of her father's hand.

"It was an emotional roller coaster," says Andres. "The NICU becomes your whole life." The family spent 12 hours to 14 hours at the hospital daily and Andres had to take a leave of absence from his job. It was a tough time financially and emotionally for the family. When Alyssa couldn't eat and



"PEOPLE'S GENEROSITY got us through a difficult time," says Andres Adame Miera, here with his daughter, Aylssa.

was not improving, local doctors suggested moving the infant to The University of Nebraska Children's Hospital in Omaha, where she could receive more specialized care.

For the next month, the family stayed in a Ronald McDonald House near the hospital, where they were given taxi and meal vouchers to help keep costs down. On Friday nights, volunteers would come in as part of the guest chef program and cook dinner for the many families staying in the house. Following that, the parents would stay up late and visit and play video games and bond over their commonality of having a critically ill child.

"All of these people left their jobs and their lives to be there for their sick kids. It became almost strange to see children without tubes sticking out of them," says Andres. "The reason the Ronald McDonald House can do what they do is the funding they get from places like Sandia. Something small can make a huge difference."

Alyssa died on May 29, 2003. The services they received from the Ronald McDonald House as well as the kindness of friends, family, and strangers helped them get through the loss of their daughter. "We need to care for each other," says Andres, "I'll never meet the people who gave money to Ronald McDonald House in Omaha; I'll never know the boy scouts who cooked us dinner, but their money and time made a difference for us in a time of need."

Ronald McDonald House Charities of New Mexico is a recipient of a United Way Community Fund grant. The home serves up to 30 families at a time that have critically ill children receiving treatment at local hospitals.

After a loved one dies, the Children's Grief Center provides support to children and their families

"You never think you'll be in a situation where you will need this type of support"

— **Tanya Jinzo**

In May 2015, Kalina Jinzo and her boyfriend were on their way to Ruidoso, New Mexico, on a motorcycle when the unimaginable happened. Lightning struck and hit Kalina in the head as she was a passenger on the bike. After several days in the hospital in Lubbock, Texas, Kalina died, leaving behind three children, her parents, a sister, and many other family members.

Kalina worked as a medical assistant at Sandia for eight years. During her time at the Labs, her co-worker and friend, Callie Lovato, says, "It took a long time for us to get over it. We're a family here. You don't just come and go like other companies. People work here for a lifetime so this loss hit the medical clinic very hard."

Kalina's sister, Tanya Jinzo, is an information systems

security technologist and has been at Sandia for 15 years. She and her parents have guardianship of Kalina's two youngest daughters, ages 16 and 11. Following the sudden and tragic loss of their mother, the girls began attending grief counseling sessions at the Children's Grief Center of New Mexico, which is a recipient of the United Way of Central New Mexico's Community Fund grants.

The Center offers free support groups for bereaved children and provides a safe place to share experiences and feelings while grieving a death. Tanya says, "You never know how amazing an agency this is until you're experiencing it. They fed us, gave us free counseling and support, and around the holidays, local artists donated handmade gifts to comfort the kids."

Tanya says the agency helped her family live through a tragic loss. Kalina's 25-year-old son and his wife are expecting their first child in February. "It's a bittersweet moment for me and my family. Kalina won't meet her grandchild," says Tanya. "My family is extremely excited about the new baby arriving in February. It's a girl and my nephew and his wife have decided to name her Kalina to honor his mom."

Having experienced homelessness as a child, Yvonne Minssen wants to help her city

Yvonne Minssen was 11 or 12 years old, when along with her mother and her three younger siblings, she experienced homelessness for the first time. She was homeless four times during her teenage years. Each time, she lost every possession she had — clothes, toys, furniture. Her family didn't have any food and she relied on the school lunch program. Yvonne's mother suffered from a drinking problem and had difficulty keeping employment.

"When people drink, they are unreliable," says Yvonne. Yvonne attended Manzano High School and worked at Sandia during her junior and senior year as part of the Youth Opportunity Trainee program. Here she met engineers and learned about possibilities she had for her future. She left her mother when she graduated from high school and was the recipient of the University of New Mexico's Presidential Scholarship. Yvonne got her degree in business and is currently studying Information and Communication Technology at New Mexico State University.

The Salvation Army gave the family food and money to help them survive during their bouts of homelessness. Because of her experiences, she says, "I was scarred by being homeless. I wasn't in control. But I don't feel scarred anymore."

As the Sandia Gives representative to her center at Sandia, Yvonne says she knows first-hand how important Sandia's United Way campaign is to the community. She chose to attend an agency tour of Albuquerque Heading Home, a local nonprofit that focuses on envisioning an Albuquerque where homelessness is rare, short-lived, and nonrecurring. "I want to help end homelessness, just like David Sisneros (Respite Care Program director of Heading Home). Before I met him, I didn't think it was possible, but now, with his data and success stories, I realize that I was wrong and that my contribution and message make a difference."



KALINA JINZO worked as a medical assistant in Sandia's Health Management Clinic at the time of her death in 2015.



YVONNE MINSSEN overcame homelessness as an adolescent and raises her family in Albuquerque. She serves as a representative this year to help promote the Sandia Gives campaign.

**New Mexico Sandia Gives Campaign
Oct. 2-20
California Sandia Gives Campaign
Oct. 2-27**

Albuquerque Heading Home is a United Way of Central New Mexico Community Fund grant recipient. The organization is a Housing-First collaboration of public, private, and nonprofit organizations that united in 2011 to end homelessness for individuals who have been chronically homeless and are medically vulnerable. More than 700 individuals and their family members have been placed in

permanent supportive housing since the initiative started in 2011.

Having spent most of her life in Albuquerque, Yvonne wants to see her city provide more services for those in need.

"I wouldn't live anywhere else. I love Albuquerque," Yvonne says. "I want to help Albuquerque."

The United Way helped me when I was in need

by Madeline Burchard

I feel privileged to be the Sandia/California project lead for Sandia Gives and work with the inspiring Sandia Gives committee to make our communities better places for everyone. However, I am passionate about this program for another reason — I personally benefited from programs funded by the United Way in 2014.

Before coming to Sandia, I worked for an educational nonprofit that provided afterschool programs in Richmond and Oakland high schools. While the work was meaningful, I earned a modest income. Between that and my wife's part-time job, we found it difficult to pay the bills at times.

When tax time came, we were hard-pressed for money and were looking forward to the relief our tax refund would provide. However, the mixture of health care shifts, job changes, freelance income, and the legal limbo of our same-sex domestic partnership made our taxes too complicated for simple, low-cost tax preparation software and services.

United Way to the rescue

We needed professional tax help, but we couldn't afford to forfeit up to a third of our refund to pay for it. That money would help us pay rent, buy groceries, and keep up with student loan payments. So we overcame our pride and asked the United Way Bay Area (UWBA) for help.

Through the Spanish Speaking Citizens Foundation in Oakland, UWBA offered low-income residents in my East Oakland neighborhood a tax prep service called "Earn It, Keep It, Save It!". The concept is simple. People who depend most on the income they earn should keep as much of their tax refund as possible. This gives families

without access to the Internet or a computer a better option than paying a tax professional or trying to navigate the complex forms themselves.

Taking those steps into the UWBA office was tough, but as soon as we spoke with the staff, I felt at ease. We were treated with respect through the entire process and left feeling relieved. We knew that our taxes were prepared correctly and that we were walking away with the refund we deserved.

UWBA and other local nonprofits don't just help the poorest among us. They help our neighbors, our loved ones, our coworkers, and maybe even ourselves.

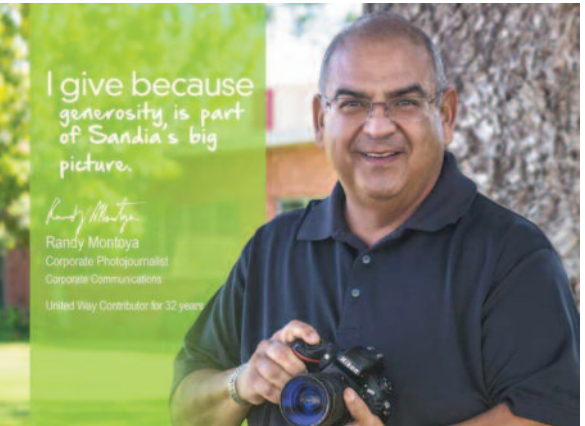
Paying it forward

Now that I work at Sandia and my wife works at Lawrence Livermore National Laboratory, I have chosen to give back to UWBA by enrolling in automatic paycheck deductions. It's a small enough amount not to be noticeable, but over the year, my contributions will add up to a significant donation for programs I believe in.



MADELINE BURCHARD, right, and her wife have benefited from United Way services. "Over the year, my contributions will add up to a significant donation for programs I believe in," says Madeline.

SANDIA GIVES



HOW YOUR DOLLARS MATTER

United Way

UNITED WAY OF CENTRAL NEW MEXICO

ONE DOLLAR A WEEK

\$52.00/YEAR
\$2.00 per pay period



Shoes and pants to prepare someone for work (Catholic Charities)



One hour of PTSD counseling for a victim of trafficking (Formation)



A calculator and SAT test prep book for a college-bound student in need (Working Classroom)

ONE DOLLAR A DAY

\$365.00/YEAR
\$14.03 per pay period



7 nights of lodging for a family, keeping parents close to their hospitalized child (Catholic Charities)



3 meals a day for 28 days for a mother and child escaping violence (Barrett)



6 months of one-on-one mental health treatment for one disabled veteran (Paws and Stripes)

FIVE DOLLARS A WEEK

\$260.00/YEAR
\$10.00 per pay period



40 books for students in an after-school tutoring program (APS Education Foundation)



3 months of formula, diapers, and baby supplies for a foster family caring for an infant with special needs (ARCA)



A weekly food basket for a homeless Veteran (NM Veteran Integration Centers)

FIVE DOLLARS A DAY

\$1,825.00/YEAR
\$70.10 per pay period



Financial literacy training classes and materials for 30 formerly homeless youth (New Life)



280 meals a year to someone who is hungry and struggling with social isolation (Meals on Wheels)



3 months of supported rent for a homeless youth transitioning from adolescence (New Day)



A GOOD SPORT — Jac Pier (10247) delivers sports equipment to the Boys and Girls Club of Central New Mexico donated by Sandia employees during this year's Guys Give Sporting Goods Drive. Sandians collected more than 300 items for the kids to use during their after school program. Guys Give is one of United Way of Central New Mexico's newest and fastest growing Affinity Groups. The group recognizes the generosity of men engaged in philanthropy and encourages more men to effect positive change in the community. To find out more about getting involved, go to goo.gl/uufU4A.

Impactful Times:

the story of decades of Sandia’s shock physics research

By Sue Major Holmes

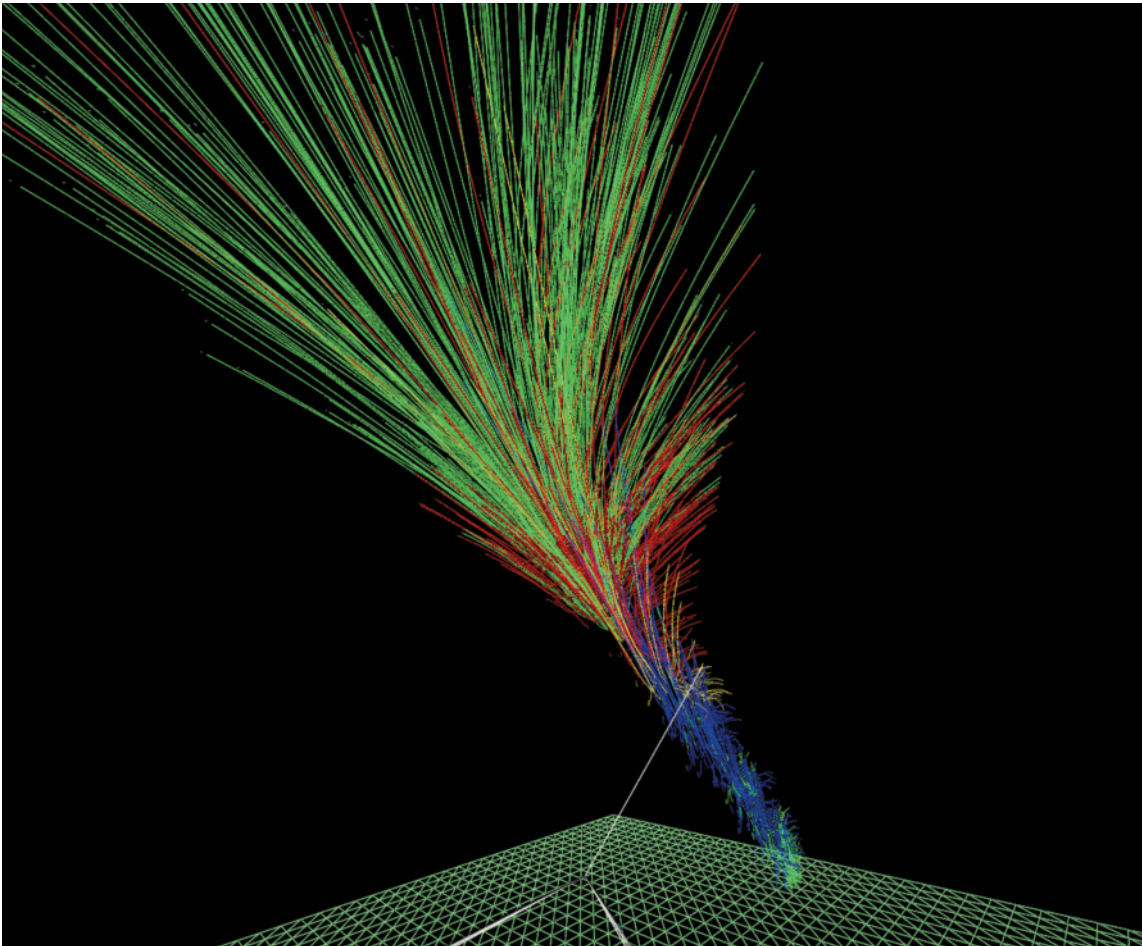
Sandia physicists Mark Boslough and Dave Crawford predicted the Hubble telescope could see a rising plume as comet Shoemaker-Levy 9 crashed into Jupiter in 1994. Their prediction, however, went against the prevailing thought that the impact would be a visual fizzle since it would happen on the planet’s far side.

Putting money on their prediction, Mark and Dave bought 8-inch telescopes and tickets to Hawaii, where Jupiter would be high in the night sky at impact, Mark recounts in *Impactful Times: Memories of 60 Years of Shock Wave Research at Sandia National Laboratories*. His story is among reminiscences by 45 researchers in shock physics, most from Sandia, in the new book by former Sandia researchers Jim Asay, Lalit Chhabildas, and Jeffery Lawrence, and current Sandia researcher Mary Ann Sweeney.

Mark, now retired, and Dave, who researches computational shock physics, were correct about the plume but didn’t see it. “It just wasn’t bright enough to see with our little telescopes ... but we saw the remarkable aftermath firsthand as the dark spot from the collapsed plume rotated into our view,” Mark wrote. The cloud plume produced by the impact matched Sandia’s computational analysis.

Impactful Times describes shock physics research at Sandia from its early history to today. Speeding bullets practically stand still compared to impact velocities achieved in shock physics studies, which deal with what solid materials — condensed matter is the scientific term — experience when objects collide with them at tremendous velocities, forming a shock that rapidly spreads and can change some of the material to a liquid, gas, or plasma.

The interdisciplinary field brings together experiments, code development, and theory to understand what happens to materials subjected to incredible forces. It’s used in work on nuclear and conventional weapons, astrophysics, planetary science, material



IMPACT — The colors in this Sandia virtual reality image represent material ejected from different depths of Jupiter from the impact of comet Shoemaker-Levy 9 on the planet in 1994. The cloud plume produced by the impact matched Sandia’s computational analysis done before the impact.

what didn’t, and the torturous paths involved in achieving the final results,” Jim says. Among those, he says, were the first gas gun-driven impact launcher, developed in 1958 for precision material property studies

and now ubiquitous in shock wave facilities around the world; development of ultrahigh velocity impact launchers, including Sandia’s Z machine that provides material data at pressures previously achieved in underground nuclear tests; and Sandia’s patented quartz gauge, which allowed the first precision measurements of material properties at low pressures. It has been superseded by advanced optical interferometric diagnostics for data at ultra-high pressures.

Recollections add details about shock wave research

The second half compiles researchers’ recollections. The invitation to contribute deliberately refrained from suggesting

how to write them. “Some recollections were written as a flow of consciousness, while others were more structured, and some were an annotated list of key publications,” Jim says. “Each added important details about shock wave work in different time periods.”

The title was chosen for the double meaning of impactful, he says. Impact techniques are the principal way to study how materials respond to shock waves. In addition, landmark accomplishments in Sandia’s shock wave research had a major impact on scientific and engineering applications and the scientific community. Accomplishments include computer simulations of Shoemaker-Levy 9’s impact on Jupiter.

Jim and Lalit, long-time colleagues who worked in shock physics for decades, say younger researchers often asked them about its history. Questions continued after Jim retired in 2002 and Lalit retired in 2007. In 2011, they decided to document Sandia’s shock compression science work.

“This was quite a formidable task because shock history at Sandia started as soon as Sandia was born in the late 1940s, and we had to research the early years,” Lalit recalls.

They wanted a co-author in the field from earlier

times and recruited Jeff, whose background in shock wave code development and material modeling dated to the 1960s. Mary Ann, of Sandia’s Pulsed Power Sciences Center, was recruited in 2013 after asking Jim about a shock physics experiment. He gave her a chapter-in-progress, then invited her as a co-author when she voluntarily edited it. As editor-in-chief of NNSA’s annual Stockpile Stewardship and Management Plan, she brought knowledge and critical editorial skills, he says.

Mary Ann was surprised by the complications of book publishing. For example, copy editors didn’t understand the word fuze, changing it to fuse throughout. She changed it back. “It’s not a household fuse,” she



SANDIA’S IMPACT — Jeffery Lawrence, Mary Ann Sweeney, and James Asay, left to right, pose at Sandia National Laboratories’ Shock Thermodynamic Applied Research or STAR facility, one of the facilities Sandia uses in shock physics studies. The trio, along with Lalit Chhabildas (see photo below), wrote about the research in a new book, *Impactful Times: Memories of 60 years of shock wave research at Sandia National Laboratories*. All but Mary Ann are now retired from Sandia. (Photo by Randy Montoya)

synthesis, and space, among others. Jeff says the theory developed for high-pressure applications also can analyze what happens at lower shock pressures. The book discusses, for example, Sandia’s analysis of a 1989 turret explosion on the *USS Iowa* that killed 47 sailors.

The first half of the 700-page book, released this spring by scientific publisher Springer as an e-book and in hardback, presents Sandia’s major research goals and accomplishments in shock compression science over six decades.

“We tried to bring out the major technical developments and breakthroughs, including what worked and



LALIT CHHABILDAS



SANDIA GAS GUN: SHOCK TESTING

says. “That was a glaring error for those in the know.” The authors say they hope to inspire experts, non-experts, and early-career material scientists and to interest students of materials science to work at Sandia or its sister national labs, Lawrence Livermore and Los Alamos. They also want to show the public what a researcher experiences — the challenges, frustrations, personal struggles, and ultimately the gratification of making a pioneering discovery or solving a problem.

“The opportunities we had were directly a result of the strong foundations laid out by our predecessors. It is their vision and all the pioneering work they had done that allowed us to proceed and accomplish what we had done,” Lalit says. “I wish I were 20 years younger because there is so much more relevant shock physics we could still be doing. I think the technology computationally, theoretically, and experimentally in shock physics has advanced so much we can now tackle problems we once could just dream about.”



Agile space for software team improves collaboration, productivity

By Julie Hall • Photos by Norm Johnson

GLASS CONFERENCE ROOM walls create an open environment.

From the outside, the three beige “T” buildings look like any other 1980s-era “temporary” trailer offices at Sandia. But step inside and it’s immediately obvious that this isn’t your manager’s mobile office building.

Instead of a central hall flanked by offices, each adjoining building is an open concept. In T37, the only barriers are glass conference room walls and a Star Trek-themed partition. In a back corner of T51, a software development team holds a stand-up status meeting, aided by a rolling monitor and notes they’ve written on the wall. In T50, in front of a kitchen-type counter with bar stools, another group reviews items on a large monitor, highlighted in red or green according to their status. The cryptic names represent pieces of the overall product and the team responsible for them.

Workers have scribbled notes, diagrams, and equations all over the walls. There is a sense of energy and purposeful activity, and the openness gives everyone a good view of the space and each other.

The buildings, dubbed the Collaboration Corridor, are home to Sandia’s Tumbo/Micro team, comprising about 60 software developers, system architects, and system engineers who are developing ground systems. Tumbo, Swahili for “abdomen” or “core,” refers to the core data processing component that Sandia is responsible for that is part of a larger project. Sandia is also executing the payload-specific “Micro” portion of the architecture, which is responsible for planning, scheduling, and tasking.

The buildings represent Sandia’s latest foray into developing agile work spaces — flexible, space-efficient work areas that encourage interaction and collaboration. Completed in September, the space is the culmination of a two-year partnership among System Mission Engineering Center 6300, Facilities and Emergency Management, and Infrastructure Services, says Dorothy Stermer, who oversaw the project for 6300 for the past year. Not your average remodeling project, the agile space repre-

A RIBBON CUTTING AND OPEN HOUSE will be held Wednesday, Oct. 18, at Center 6300’s Collaboration Corridor, Buildings T37, T50, and T51.

All Sandians are welcome.

10:30 a.m. Welcome and networking
11 a.m. Ribbon-cutting ceremony

- Mike Duvall, NNSA/SFO Deputy Field Office Manager
- David Douglass, Deputy Labs Director
- John Clymo, Associate Labs Director, Infrastructure Operations
- John Zepper, Director, System Mission Engineering

Post ribbon cutting to 3 p.m.

- Building tours and refreshments

sents a close coupling of experts in agile methodology, computer science, ground systems development, facilities planning, and enterprise IT to design a state-of-the-art agile environment.

“It’s challenging to attract and retain computer science and computer engineering talent,” Dorothy says. “This remodel incorporates the latest ideas from agile development to create an inviting space for knowledge workers, something our new hires expect. So far, the response and the results have been positive.

(Continued on next page)



WRITABLE SURFACES include the walls.



CAFE TABLES encourage spontaneous discussions.



THE “WARP SPEED” partition is part of T37’s *Star Trek Next Generation* theme.

Why ‘agile’ workspaces?

Workspaces based on “agile” principles are flexible, space-efficient, and designed to encourage interaction, collaboration, and innovation. Agile workspaces are based on key principles from *The Agile Manifesto*, written in 2001 by a group of thought leaders seeking to encourage better ways of developing software. The manifesto is the foundation of the agile movement, which has spread to numerous areas beyond software because of its ability to help organizations cope with continuous change.

Center 6300’s project incorporated the following agile principles:

1. The most efficient and effective method of conveying information to and within a development team is face-to-face conversation.
2. The best architectures, requirements, and designs emerge from self-organizing teams.
3. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done.


“Everything the team needs is within their collaborative work space,” says Alfred Lorber. Putting everything and everyone in the same space reduces the cycle time to solve problems.” Alfred helped create and shape the Collaboration Corridor as part of his responsibility for facilitating execution and improvement of 6300’s agile process.

A key aspect of agile spaces is common areas that are purposefully structured to create what Steve Jobs called “unplanned collaborations.” Incidental interactions occur when people cross paths as part of their normal routines, such as in stairwells or on their way to a breakroom. The idea is that chance encounters may lead to a novel idea or solution to a problem.

For example, Google’s New York City office is structured so that no employee is more than 150 feet from food. The idea is that as employees get up to get a snack they may accidentally bump into coworkers from different teams. Research has shown that chance encounters and conversations are not only conducive to sparking innovation and fresh ideas, they also improve employee satisfaction.

Agile spaces differ from collaborative workspaces. Collaborative workspaces are tailored to a specific purpose and are where workers spend part of their time in addition to their regular office, Alfred says. An agile workspace supports all of the potential work types the employees housed there may perform and is where they spend most of their work time.

Mileposts



New Mexico photos
by Michelle Fleming

California photos
by Randy Wong



Barney Doyle 40



Mario Ramirez 40



Rik Holman 35



Rick Howe 35



Riley Kilgo 35



Mark Platzbecker 35



Mark Poiles 35



Jim Handrock 30



Bryan Guernsey 25



Scott Mitchell 25



Jennifer Plummer 25



Sandy Tonnesen 25



Riyaz Natha 20



Ed Barnat 15



Patricia Brown 15



Shawn Dirk 15



Sean Dunagan 15



Mark Forster 15



Charla Garcia 15



Todd Ritterbush 15



Rubyann Sanchez 15



Harriette Smith 15



Chris Stork 15

Agile workspace

(Continued from preceding page)

“Everyone agrees it’s been fantastic,” says computer scientist Stephen Rowe, who participated on the team that developed the building requirements. Locating all the team members in one place and creating an environment that enables the team to successfully implement agile development has “improved our code, algorithms, and speed of development.” Says Jeff Brooks, manager of Next Generation System Architectures: “Getting people co-located has been a significant factor in our ability to increase productivity across the teams and the program.”

Agile: emphasis on face-to-face interaction

Agile is a methodology for building products incrementally using short iterations so the process can continually adjust to changing business needs. Teams work on different components of the software, engaging in frequent face-to-face communication to deal with changes and obstacles as they arise.

Since working software is the primary yardstick for progress, the status of each team’s current effort is displayed on an electronic status board strategically positioned in a high-traffic area near the restrooms and kitchen area. Green indicates the code has been tested and has passed; red indicates a problem that must be addressed.

The quickest and easiest way to address an issue is to hold a quick stand-up meeting or find the person you need to talk to and have a quick discussion, says computer scientist Jeff Sallade. “All the people I need to talk to are right here,” he says. Rather than sending an email, “it’s easier if I can just catch them in person.”

Creating a productive, inclusive environment

New hires start working with their teams in the space from their first day, allowing them to quickly make meaningful contributions, Jeff says. He cited one example of a new hire who started on a Monday and was making contributions to code by Friday, progress that typically would take a few months. New hires are more inclined to ask questions when they’re in close proximity to their mentors, he adds.

“Bringing new hires together with their team is also a very inclusive aspect of this building,” adds Stephen, who came to Sandia two years ago after graduating from Texas A&M.

Prior to moving to the Collaboration Corridor, the Tumbo/Micro team had a



THE CENTRALLY LOCATED kitchen area fosters “incidental” interactions.

“nomadic” existence as its collaborative space moved from one vacant space to another. Their first effort was in M0303. Stephen was working on an LDRD project with an intern housed in M0303 with other summer students. When he discovered the building was vacant the rest of the year, he proposed moving the team there to his manager. Some of the 6300 managers had a similar idea at about the same time, including Roy Fitzgerald, who preceded Dorothy as 6300 Engineering Operations Manager, and Alfred Lorber. Roy and Alfred saw the project’s vision.

The move to M0303 was “a game-changing improvement,” says Stephen.

“As a team we found it was a lot more productive if we involved everybody,” says Jeff. When new occupants moved into M0303, the Tumbo/Micro team set up temporary spaces in Bldg. 894 and then 890. When the T37/T50/T51 space became available, 6300 pitched the redesign project to Facilities, which embraced the vision.

“We have been looking at collaborative space for a long time,” says Lynne Schluter. “It’s hard in our security culture to get people thinking outside the traditional individual offices.” In 2016, Lynne and other participants in the National Security

Leadership Development Program (NSLDP) team toured Stanford University’s d.school, a teaching institute for design and experiential learning, and IDEO, an international design and consulting firm in Palo Alto, California, and came away excited to try something similar at Sandia.

Facilities worked closely with Center 6300 throughout the design process, incorporating lessons learned from the M0303 and 894 experiences, such as including a private meeting area.

Efficient use of space

Through its open concept and use of glass walls and partitions, the Collaboration Corridor houses nearly three times as many people as when the buildings contained private offices. Each building is designed around a different theme — Nature, Euro Disco, and *Star Trek Next Generation* — which is carried out through the choice of colors, floor coverings, and other design features. Furniture and whiteboards are mobile so they can be easily moved for impromptu meetings. Lighting is dimmable.

“It’s a great space,” says Jeff. “For a large collaborative project, it really works well.” Alfred says it’s been interesting to see the attitudinal shift toward agile workspace among some developers. “Typically, there is a subset who initially say ‘hell no,’ I can’t work that way,” he says. “But then you get them in there and you can’t pry them out.”

SANDIA CLASSIFIED ADS

MISCELLANEOUS

CAGES, 2 small animal, Kaytee, w/water bottle: 24”L x 12”W, \$30; 30”L x 18”W, \$40. Gallegos, 505-681-0780.

HUTCH & ARMOIRE, dark cherry finish, excellent condition, \$600/both. Hennessey, 505-506-7936.

MICROSOFT SURFACE PRO 4, Intel Core i5 processor, 256 GB, 8 GB RAM, \$700. Martinez, 505-515-9440.

REPTILE HABITAT: aquarium, water dispenser, electric warming pad, hiding cave, unopened bag of walnut bedding, \$25. Lauben, 505-980-2915.

WOOD LATHE, 12” x 36”, 1/2-hp, 115-V, 7-spd., turning tools, face plate, 5/8-in. drill chuck, \$125. Rizkalla, 286-9278.

SCANDINAVIAN FESTIVAL, Nov. 4, 10 a.m.-4 p.m., St. Luke Lutheran Church, 9100 Menual Blvd. NE, Norwegian/Swedish folk art, dancing, food, etc. free. Richard-Franco, 505-294-5739.

CUSTOM BDA UTILITY TRAILER, 4’x 4’x 6’, \$1,650; X-Cargo Sport 20, motorcycle trailer w/bracket, \$350; located in East Mountains. Willmas, 505-281-9124.

PORTABLE OXYGEN CONCENTRATOR, Philips Respironics Simply Go Mini, never used, \$500. Gollan, 505-323-5317, jeangollan@icloud.com.

PORTABLE BASKETBALL HOOP, Life-time Slamdunk, adjustable, originally \$200, asking \$90; Sportscraft air hockey table, 2’ x 4’, \$35. Fernandez, 505-506-0007.

VACATION BEACH CONDO, Cabo San Lucas, Dec. 28-Jan. 4, 2-bdr., 3 baths, Villa Del Palmar Cabo, \$3,900. Carrasco, 505-803-3831.

FRENCH PRESS COFFEEMAKER, Bodum, 12 oz., black, w/instructions, never used, made in Denmark, \$10. Wagner, 505-504-8783.

SPA & BATH PILLOW, super soft, \$20; Proform Fitness 225C stair stepper, \$75; St. Nicholas Square pharmacy, train station, \$40 ea. Weagley, 505-385-4059.

ALFALFA, 2 string bales, \$6; Ford longbed red camper shell, w/sliding windows, \$350 OBO. Schroeder, 505-917-4516.

CHAINSAW, 20-in., Craftsman, 50 cc, 2-cycle, gas, brand new, never used, still in unopened box, \$200. David, 505-553-2769, ask for Carolyn.

BOWFLEX SPORT, w/accessories & exercise book, \$100, will consider reasonable offers. Maestas, 505-550-0163.

TREADMILL, NordicTrack C2200 w/manual, \$100; Adams golf irons, w/Nike bag, 5-PW, \$75. Gallagher, 265-0299.

DSLR CAMERA, Nikon D7000, like new, in box, w/battery, charger & cables, \$300. Schwartz, 505-220-6301, ask for Barry.

ALL-IN-ONE PRINTER, HP OfficeJet 4215, Q5600A, used, \$20. Jensen, 821-2373.

FALL FOOD DRIVE, Cassini kittens in Saturn’s rings, more, visit <http://www.fabulousfelines.org>. Stubblefield, 263-3468.

SKI BAGS, 2 REI Evaporator bags, one size fits all, like new, used once, \$30 ea. Knapp, 323-9975.

TRANSPORTATION

’01 HONDA S2000, MT, red, black interior, 99K miles, very good condition, \$11,000 OBO. Gonzalez, 505-480-4889.

’63 SUBURBAN, original windows & seats, \$6,000 w/new rims & tires, \$5,000 w/o. Maldonado, 818-0751, ask for Darlene.

’04 DODGE RAM 1500, 4x4, w/Leer camper, 131K miles, runs awesome, \$8,500. Amador, 259-8919.

How to submit classified ads

DEADLINE: Friday noon before week of publication unless changed by holiday.

Submit by one of these methods:

- EMAIL: Michelle Fleming (classads@sandia.gov)
- FAX: 844-0645
- MAIL: MS 1468 (Dept. 3651)
- INTERNAL WEB: From Techweb search for ‘NewsCenter’, at the bottom of that page choose to submit an ad under, ‘Submit an article’. If you have questions, call Michelle at 844-4902. Because of space constraints, ads will be printed on a first-come basis.

Ad rules

1. Limit 18 words, including last name and home phone (If you include a web or e-mail address, it will count as two or three words, depending on length of the address.)
2. Include organization and full name with the ad submission.
3. Submit ad in writing. No phone-ins.
4. Type or print ad legibly; use accepted abbreviations.
5. One ad per issue.
6. We will not run the same ad more than twice.
7. No “for rent” ads except for employees on temporary assignment.
8. No commercial ads.
9. For active Sandia members of the workforce, retired Sandians, and DOE employees.
10. Housing listed for sale is available without regard to race, creed, color, or national origin.
11. Work Wanted ads limited to student-aged children of employees.
12. We reserve the right not to publish any ad that may be considered offensive or in bad taste.

’70 MUSTANG FASTBACK, excellent condition, call for more info, \$30,000 OBO. Pohl, 239-6701.

’14 MUSTANG, premium V6 coupe, 6-spd. manual, comfort & appearance pkgs., 33K miles, \$15,900 OBO. Werner, 315-440-2844.

’08 DODGE MAGNUM, new paint & body work, runs well, see at base car lot, \$3,900 negotiable; Baskerville muzzle, 6-in. \$18. Brewster, 238-4704.

’06 HUMMER H3, new tires, all maintenance records, reliable tow pkg., adult driven, 86K miles, excellent condition, \$14,500 OBO. Burr, 505-293-2588.

’98 CORVETTE CONVERTIBLE, red, supercharged, very fast, 88K miles, excellent condition, \$18,500 OBO. Marchi, 363-3024.

’15 JEEP GRAND CHEROKEE LAREDO, 4WD, 6-cyl., all power, black pearl, sunroof, 8-in. touchscreen, 15K miles, like new, \$29,500. Mahler, 275-9302.

’03 HYUNDAI ELANTRA GT, salvage title due to past accident, fully restored, wonderful, reliable car, 44K miles, excellent condition, \$6,500 OBO. Goodson, 505-407-1688.

RECREATION

’13 KEYSTONE HIDEOUT 22RBWE TRAVEL TRAILER, Western edition, w/generator & extras, \$14,500. Hebert, 859-358-4553, ask for Amanda.

’06 DUCATI MONSTER S2R1000, Zard exhaust, new rear tire, w/stand, 5,500 miles, exceptional condition, \$6,000 OBO. Biedermann, 650-804-6393.

’16 HONDA SHADOW AERO MOTORCYCLE, 750 cc, almost new, 1 owner, 2,340 miles, 4 yrs. left on transferable premium care warranty w/roadside assistance. Schaub, 299-3785, ask for Joe.

’15 BMW G650GS, low suspension, heated grips, center stand, Givi top case, 2,700 miles, \$5,250. White, 238-2437.

REAL ESTATE

DOWNTOWN PENTHOUSE, contemporary, views, 1,849-sq. ft., 20-ft. glass walls, rooftop deck, 2 additional patios, \$399,500. Doak, 530-601-1960.

2-BDR. HOME, 2 baths, 1,568-sq. ft., charming, East Mountains, 50 Adobe Lane, Sandia Park 87047, new everything. Anderson, 505-453-5522, ask for Lonnie.

3-BDR. HOME, 2 baths, open living space, new floors, air & appliances, Thomas Village, North Valley, \$450,000. Green, 505-239-6914.

4-BDR. HOME, 3 baths, 4,234-sq. ft., modern, Four Hills neighborhood, \$625,000. Mohagheghi, 505-321-3399.

3-BDR. CUSTOM HOME, 2-1/2 baths, 4-1/2 car garage, 2,700-sq. ft., 3+fenced acres, <http://themountain-snm.volasite.com>, \$349,000. Matthews, 505-980-4917.

WANTED

ROOMMATE, Tramway/Indian, private bath, bed, kitchen, living room 10 mins. to Eubank, \$900/mo., utilities included. Chavez, 505-550-6608.

FOREVER HOME, Butch, brindle pit bull, 4 yrs. old, incredibly sweet, good w/other dogs, behaves on/off lead, loves to run, test drives available. Jennings, 505-610-1142.



John Clymo

(Continued from page 12)



JOHN’S THREE PASSIONS — His kids, rodeo travel, and Beechcraft. (Photo courtesy of John Clymo)

lot of hard work mending fences and tackling livestock. Originally from the Napa Valley in California, when he was about 10 years old, John’s family of farmers and ranchers moved to Silverdale, Washington, where they raised pigs. “I left the pig farm when I was 18 and never returned, but my love for horses is the constant in my life,” he says.

John is a gold card holder in the Professional Rodeo Cowboys Association (PRCA). He won his first PRCA rodeo in 1975. Before joining Sandia, he was active in the 2016 rodeo season, winning three pro rodeos in California in steer wrestling. “I have my sights on the 2018 rodeo season and I plan to participate in about 20 rodeos,” he says. John also participates in Indian Rodeo circuit as a member of the Shawnee Tribe. John is part Native American — his mother was born on the Cherokee Nation in Oklahoma.

Since returning to New Mexico, John, his six horses, and his great-aunt Lena’s 1930 Ford Model A now call Edgewood home. “I’ve always wanted to live here and I’m planning to stay this time,” he says.

Back in the Saddle

Now that he’s back, John is ready to roll up his sleeves and put his world-renowned facilities management skills to work at Sandia.

“Since the transition began in January, I’ve been able to identify areas where we can apply the experience I gained from my work at three national laboratories and NNSS to optimize Sandia’s facilities services,” says John. “It turns out, in all my travel and various roles, I’ve already been to all the sites operated by Sandia (New Mexico, California, Kauai, and Tonopah), as well as those sites where we perform activities. Coming into this role, it’s provided a helpful insight into what we do and the services that the Infrastructure Operations Division offers.

“There are a lot of good things that the Division 4000 workforce has been doing to keep things running smoothly, but there is much more we can do to bolster the consistency and quality of our infrastructure and our services,” John says. “And I’m excited to help lead this initiative.”

Standing 6 feet, 3 inches with the build of a champion lead tackler, John may seem intimidating. But if you have the chance to stop and say hello, he’s not shy and enjoys meeting new people.

“It’s interesting hearing about people’s different backgrounds. The more we learn about one another, the more commonalities we find,” John says as a call to other Sandians to get to know him so he can get to know you.



RODEO STAR — John and his super horse “Elmer” during their championship season. John holds many PRCA and Indian rodeo titles, including the 2003 Senior Pro World Championship that was held in Reno, Nevada. This year, he’s looking forward to spending time at the new Stanley-Cyclone equestrian and livestock arena near his home in Edgewood, New Mexico. (Photo courtesy of John Clymo)

Saddling up to tackle some big initiatives

by Karli Massey

John Clymo, Associate Labs Director for Infrastructure Operations Div. 4000, talks about how his background can help ensure a stable and secure platform for the future of Sandia’s facilities.

Starting when he was five years old, John Clymo spent part of his childhood summers at his aunt and uncle’s ranch near Pie Town, New Mexico. Since then and after years of globetrotting, he’s been eager to settle down in the Land of Enchantment. When John got the call about joining the NTESS contract team, not only was he looking forward to bringing his expertise in facilities management to the table, he was excited about the opportunity to call New Mexico home again.

John’s career has taken him across the world, managing site construction and operations in 14 countries. His first job out of school was with Pan Am World Services for the Washington state-based Trident Support Project, where he was a maintenance worker in the electrical shop.

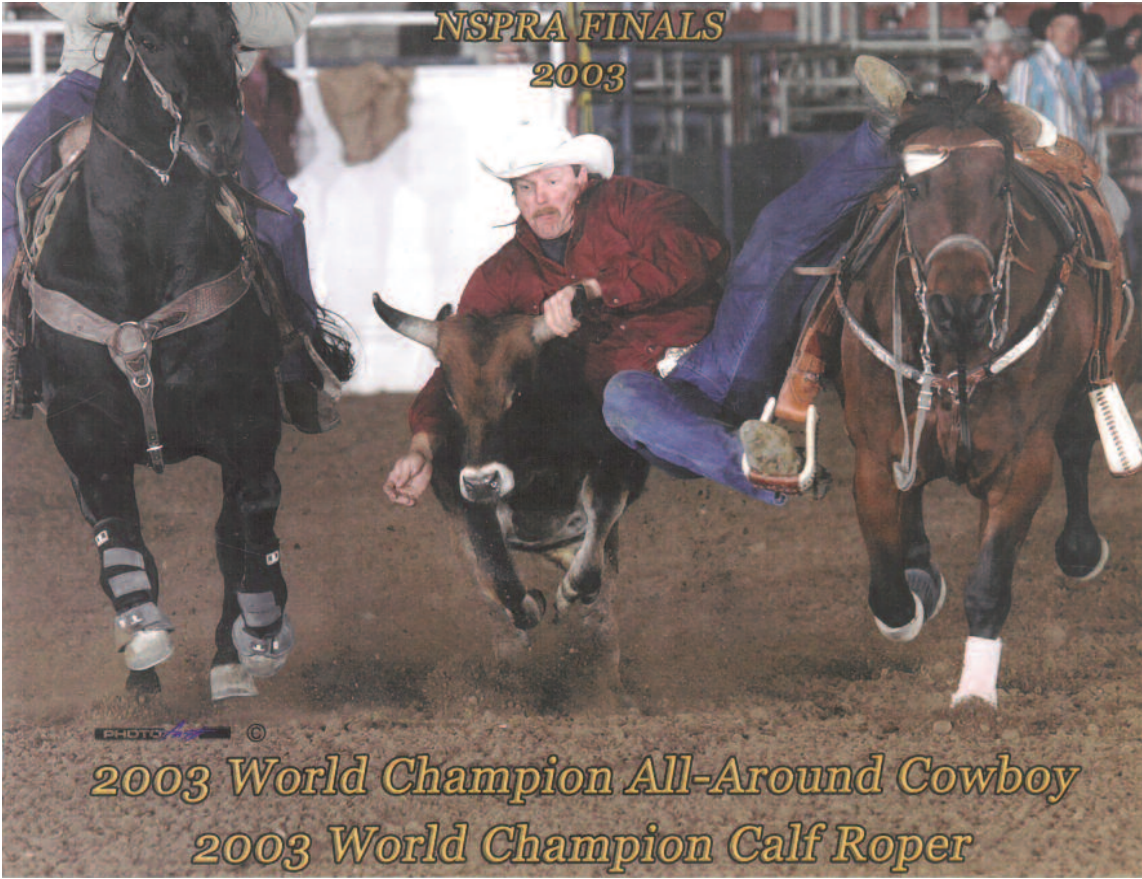
“When I first started, I thought I had the best job I’d ever have,” he says. “I was working in cathodic protection at the delta pier at the submarine base. I’d take my small boat out under the piers to perform corrosion inspections and replace sacrificial anodes. Cruising up and down the Hood Canal on those beautiful sunny days in July, the water was like glass. That’s when I thought I’d found my perfect job. Then, it got to be November. The best job in the world turned out as one of the worst jobs in the world — winter in Washington state on the Hood Canal can be brutal.”

John says he now has the best job in the world as ALD for Sandia’s Infrastructure Operations Division, which, he jokes, is less weather dependent than those days on Hood Canal.

After five years working in various capacities for the Trident Support Project, John took on the role as manager of contracts and administration for the China Lake Naval Weapons Center in Ridgecrest, California. This is where his experience in M&O contract transitions soon became a common theme in his career path. Pan Am eventually lost the contract to manage China Lake, but in the meantime, it had won the contract to replace Zia Corporation as the facilities contractor at Los Alamos National Lab in 1986.

“I was enjoying life in New Mexico,” reflects John. “My wife and our two kids had fun being close to family. I had the opportunity to work on some interesting projects at Los Alamos Lab, as well as at Santa Fe Community College. In fact, there are several people I met during that time who are here at Sandia now.”

Two years later however, career advancement and new opportunities beckoned. “I had taken advantage of



LET’S RODEO — John clinching his 2003 Senior Pro World Championship at Reno, Nevada. (Photo courtesy of John Clymo)

the company’s educational program to earn a law degree and started to gain solid experience in federal procurement contracts,” John says. “Also around that time, Pan Am World Services was bought by Johnson Controls. After a short stint at corporate headquarters, I was then assigned overseas to coordinate joint venture activities that included operations in England, the Philippines, Mauritius, Somalia, Oman, and most notably, the Diego Garcia Naval Support Facility in the British Indian Ocean Territories for Desert Shield and Desert Storm activities.”

From 1993-1995, John was general manager for facilities management and buildings systems in the Asia/Pacific region. He consulted on the construction of the 88-story Republic Plaza in Singapore and the 60-floor Tonga Town in Bangkok while also serving as the general manager of the US Base Operating Support Contracts at Sembawang and Paya Lebar.

“It was an adventurous time,” he says. “During college, I had learned scuba, so I was able to dive at the most incredible destinations in the world when I had time to explore. Most memorable was the Sipadan Island in Malaysia — it’s known as the top diving destination in the world, according to both John and Jacques Cousteau.

“But after six years overseas, I asked to be repatriated,” says John. “At that time, Johnson Controls partnered with Bechtel and won the contract to manage the Nevada National Security Site (NNSS). I joined the transition team and oversaw project administration that included human resources, pensions, investments, ethics, procedures, and legal, as well as housing, feeding, and custodial.”

From there, a Bechtel team won the contract at Idaho National Laboratory and John was asked to serve as the director of Infrastructure.

“I think my five-year tenure at Idaho had the most

impact on my career so far,” he says. “Our team was able to change the way the lab did business and we demonstrated numerous improvements to our capital expenditure procurement process.”

In 2004, John was asked to come back to NNSS as the site operations manager. “It was an honor to be asked to return. I guess I was doing some things right,” he says. “Shortly thereafter is when I started working with Dr. Younger.”

Bridging his previous time at NNSS, John spent eight years in management at that site, where he had a chance to work with many Sandians, which brought him to New Mexico numerous times.

The next stop in John’s DOE-complex journey was just across the street from the Sandia/California site. From 2009-2011, he was Lawrence Livermore National Laboratory’s senior manager of business and operations, responsible for site sustainability planning, utilities management, and environmental compliance.

Sunny Side Track and Horsing Around

“While in California, I was presented with an interesting opportunity to participate in the development of a utility-scale solar project,” says John. “I left my position at LLNL and focused on developing this project. We commissioned the 4.2-megawatt array in March 2013. It was a bit of a departure from what had been doing and I had fun learning about that industry.”

John’s other role was the company pilot. In addition to learning to scuba dive in college, John took flight training and has become a multi-engine instrument-rated pilot.

“After the solar project took flight, I decided to take some downtime,” John says.

Although, “downtime” for John typically involves a

(Continued on page 11)



TEAM PLAYER — John’s (#44) University of Puget Sound football team was the 1976 season Northwest small college football champions. Lessons in leadership and never giving up come from his days in football, he says. (Photo courtesy of John Clymo)



JOHN CLYMO, Associate Labs Director for Infrastructure Operations Div. 4000, says, “There are a lot of good things that the Division 4000 workforce has been doing to keep things running smoothly, but there is much more we can do to bolster the consistency and quality of our infrastructure and our services.” (Photo by Randy Montoya)